

REMARKS

I. Status of the Application.

Claims 1, 4-6, 8, and 10 were pending in the Application as of the date of the Final Office Action. In the Final Office Action, the Examiner:

(a) withdrew the prior rejections of claim 10 under 35 U.S.C. § 112, first paragraph, and claim 1 under 35 U.S.C. § 112, second paragraph;

(b) maintained the prior rejection of claim 8 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite;

(c) rejected claims 1, 4 and 6 under 35 U.S.C. § 103(a) as allegedly being obvious over Japanese Patent Application No. 62235704 (Patent No. JP401081167A) to Tajima et al. ("Tajima") in view of U.S. Patent Application Publication No. US2002/0028380 of Tanjo ("Tanjo");

(d) rejected claims 8 and 10 under 35 U.S.C. § 103(a) as also allegedly being obvious over Tajima in view of Tanjo; and

(e) rejected claim 5 under 35 U.S.C. § 103(a) as allegedly being obvious over Tajima in view of Tanjo as applied to claims 1, 4, and 6, and further in view of U.S. Patent Application Publication No. US2003/0122983 of Nakai et al. ("Nakai").

In this Response, Applicant respectfully amends claim 8, cancels claim 9, adds new claims 11-21, and submits the following remarks. Applicant respectfully submits that the following remarks herein traverse or overcome the Examiner's rejections to the claims of the present Application, and that claims 1, 4-6, 8, and 10-21 are in a condition for allowance.

II. No New Matter Is Introduced by Way of Amendment.

Applicant respectfully submits that no new matter has been introduced by way of amending claim 8 or adding new claims 11-21. Applicant respectfully submits that the amendments to claim 8, as referenced in Section III below, is made consistent with the Examiner's suggestion so that the claim is consistent with the specification and claim 1. New claims 11-21, as presented herein, claim subject matter found in paragraphs [0025], [0026], [0028], [0031], and [0035] and do not add any new matter. Applicant respectfully submits that by adding new claims 11-21 along with the cancellation of claim 9, no additional claim fees are incurred at this time. Accordingly, Applicant respectfully requests that claims 1, 4-6, 8, and 10-21 of the Application proceed to allowance for the reasons provided herein.

III. The Rejections of Claim 8 Under 35 U.S.C. § 112, Second Paragraph, is Overcome and Should be Withdrawn.

In the Final Office Action, the Examiner maintained the prior rejection of claim 8 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Specifically, and regarding claim 8, the Examiner alleged that it was not clear as to where the "upper region" is located and that it was not clear as to what the density referred to (actual material or overall density) as claimed therein. Final Office Action, pages 2-3.

Regarding the phrase "upper region" as claimed in claim 8, applicant has amended claim 8 so as to follow the language used in claim 1, as such language was deemed acceptable by the Examiner.

In addition, and regarding the use of the term "density" within claim 8, paragraph [0026] of the present Application reads as follows:

The rod-shape, sponge-shape, or fiber-shape shows the condition that the carbon material is formed on the substrate with differing void percentages. That is to say, rod-shape, sponge-shape, or fiber-shape shows the condition that the carbon material has a void percentage like seaweed or algae. The rod-shape is a wide carbon material that protrudes into the upper region, for example the *density* is 1.4 g/cm³ as a layer. The sponge-shape is the carbon material finer than the rod-shape that protrudes into the upper region, for example, the *density* is 0.75 g/cm³. The fiber-shape is even finer than the sponge-shape that protrudes into the upper region, for example the *density* is 0.4 g/cm³. The *density* of a typical layer or membrane is, for example, 2.4 g/cm³. The numerical values of these densities are just one example and can be selected as desired. The rod-shape may also be called cylindrical shape; the sponge-shape may also be called chain shape; and the fiber-shape may also be called filamentous shape. (emphasis added)

As noted above, the Application makes reference to densities in connection with the "active electrode material" as claimed in claim 8. This is further supported by the above-referenced excerpt of paragraph [0027] that identifies that the "carbon material" has a higher density, or lower void percentage, at one area and a lower density, or higher void percentage, at another area. Applicant respectfully submits that one skilled in the art would understand this language as it is clear within the specification of the present Application. In addition, the term "porosity" as referenced by the Examiner is used only once within paragraph [0080] of the Application, and is not used in a manner that would conflict with the use of the references to a higher density (or lower void percentage) and to a lower density (higher void percentage) as referenced in paragraph [0027]. Accordingly, the use of the term "density" in claim 8, as described in paragraphs [0026] and [0027] of the Application, is not indefinite, and the rejection

of claim 8 under 35 U.S.C. § 112, second paragraph, regarding the use of said term should be withdrawn in view of the foregoing remarks and the current amendments to claim 8.

IV. The Rejection of Claims 1, 4, and 6 Under 35 U.S.C. § 103(a) as Allegedly Being Obvious Over Tajima in View of Tanjo is Overcome and Should be Withdrawn.

Applicant respectfully submits that the rejection of claims 1, 4, and 6 under 35 U.S.C. § 103(a) is overcome and should be withdrawn for the following reasons. Considering the Examiner's detailed comments contained within pages 9 and 10 of the Final Office Action, Applicant respectfully submits that Tajima and Tanjo, either alone or in view of one another, do not disclose all of the limitations of independent claim 1, for which rejected claims 4 and 6 are dependent therefrom.

Applicant respectfully disagrees with the rejection of claims 1, 4, and 6 for at least the reason that Tajima and Tanjo do not teach, disclose, or suggest a current collecting structure comprising a current collecting substrate with a carbon material formed thereon having a higher density near the current collecting substrate and a lower density in an upper region as claimed in claim 1. In addition, and to be motivated to combine the references, one skilled in the art, without the teaching of the Applicant's disclosure, would have to look at Tajima and Tanjo and determine that some benefit would result from using carbon on a current collecting substrate and having the carbon present at two different densities, and Applicant respectfully submits that no such motivation exists within the cited art.

The teaching of Tanjo that a non-carbon material can be formed to have differing densities by utilizing binders and differing pressures would not motivate one skilled in the art to

form a carbon material having differing densities without the use of a binder. "It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements." *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957 (Fed. Cir. 1997). Applicant respectfully submits that the Examiner has not established that the separate elements existed in the prior art, much less established a teaching or suggestion to combine. The Examiner is not simply modifying Tajima by replacing the carbon material formed without a binder disclosed therein with the varying density non-carbon active material formed utilizing a binder disclosed in Tanjo (see Tanjo [0023] and [0033]), but rather suggesting that a one skilled in the art having read Tajima and Tanjo would be motivated to form, and have a belief in the likelihood of success in forming, a carbon material having differing densities without the use of a binder as claimed in Applicant's claim 1. Applicant respectfully submits that this conclusion is not supported by the references or by any indication of the level of skill in the art.

Furthermore, Applicant respectfully submits that the failure of Tanjo to disclose or even consider the use of carbon overcomes the present rejection of claim 1 over Tajima in view of Tanjo. In particular, and as noted above, the various lithium metal oxides as referenced in Tanjo are clearly different that the carbon active materials referenced within the present Application and as referenced in Tajima. Applicant respectfully submits that one skilled in the chemical arts would be able to clearly differentiate between lithium metal oxides and carbon, and would clearly understand their differing properties and compositions. Accordingly, and as explained in further detail herein, the comparison and potential use of a lithium metal oxide in one reference

in connection with a carbon in another reference would require some sort of inherent teaching or motivation within said references to use one material instead of another, especially given their drastically different compositions and properties.

Applicant is not attacking Tajima and Tanjo individually. Rather, Applicant argues that neither Tanjo nor Tajima disclose "a carbon material formed on said current collecting substrate without the use of binders, wherein said carbon material has a higher density near the current collecting substrate and a lower density in an upper region" rendering the combination deficient in disclosing this claimed element.

In addition, Applicant respectfully submits that the positive electrode active material of Tanjo is formed by "the positive electrode active material [being] *mixed with a binder* in a solvent to be in a paste state, and the paste is coated on the positive electrode collector, and dried." Tanjo, paragraph [0035], emphasis added. Therefore, Applicant respectfully submits that combining Tanjo with Tajima would result in an electrode structure that utilizes a binder contrary to the limitations of claim 1.

Furthermore, and as noted in Tanjo, "the porosity of the active material layer can be adjusted by changing pressure when pressing the layer after the paste containing the positive electrode active material and the conductive material is coated on the collector and dried." Tanjo, paragraph [0059]. Tajima's abstract discloses only a single compression carried out after vapor deposition not coating with a paste including a binder. Therefore, it is understood that the presence of the binder and multiple pressings are necessary to obtain the differing porosities in Tanjo, and Tajima stresses the lack of a binder and only a single pressing. Applicant respectfully

submits that Tajima teaches away from using the active material of Tanjo, which includes a binder, since Tajima emphasizes the use of no binder and no conductive material. Accordingly, Applicant respectfully submits that either Tanjo and Tajima teach away from their combination, or that such a combination would result in an inoperable device.

In addition, Tanjo also indicates that the amount of binder may affect the porosity. As referenced within Tanjo, "[t]he porosity was adjusted by the amount of the solvent, drying conditions and the pressing of the electrode" (paragraph [0075]), leading to the possibility that an inoperable combination would be created if the binder is removed from the active material of Tanjo et al. as required by the claims and Tajima et al.

Therefore, and consistent with the foregoing, (i) all of the elements and limitations of claim 1 are not disclosed by combining Tanjo and Tajima, (ii) there is no inherent motivation or suggestion to combine Tanjo and Tajima as required for a *prima facie* allegation of obviousness, and (iii) Tanjo and Tajima either teach away from one another, or their combination would result in an inoperable device as referenced above. Accordingly, and at least for the reasons stated above, Applicant respectfully submits that the rejections of claim 1 under 35 U.S.C. § 103(a) over Tajima in view of Tanjo is overcome and should be withdrawn.

In addition, Applicant respectfully submits that the rejection of claims 4 and 6 in view of Tajima and Tanjo is also overcome and should be withdrawn because claims 4 and 6 depend from nonobvious claim 1. "If an independent claim is not obvious under 35 U.S.C. §103, then any claim depending therefrom is not obvious." MPEP § 2143.03 (citing *In re Fine*, 837 F.2d

1382, 1385 (C.C.P.A. 1970)). As claims 4 and 6 depend from nonobvious claim 1, the rejection of claims 4 and 6 is moot and should be withdrawn.

V. **The Rejection of Claims 8 and 10 Under 35 U.S.C. § 103(a) as Allegedly Being Obvious Over Tajima in View of Tanjo is Overcome and Should be Withdrawn.**

Applicant respectfully submits that the rejection of claims 8 and 10 under 35 U.S.C. § 103(a) is overcome and should be withdrawn because Tajima and Tanjo, either alone or in view of one another, do not disclose all of the limitations of independent claim 8, for which rejected claim 10 is dependent therefrom.

Applicant respectfully disagrees with the rejection of claims 8 and 10 for at least the reason that Tajima and Tanjo do not teach, disclose, or suggest an electrode active material formed on said current collecting substrate without the use of binders, wherein the electrode active material has a density greater than 1.4 grams per cubic centimeter in a lower region near the current collecting substrate and density less than or equal to 1.4 grams per cubic centimeter in an upper region as claimed in claim 8, as currently amended.

Applicant respectfully submits that the majority of the arguments presented in the rejection of claim 8 and 10 are the same, or substantially similar to, the rejections presented in view of claims 1, 4, and 6. Accordingly, Applicant respectfully reiterates each argument referenced in Section IV above by reference as also being applicable to rejected claims 8 and 10.

In particular, and as noted above, Applicant respectfully submits that the positive electrode active material of Tanjo is formed by "the positive electrode active material [being] *mixed with a binder* in a solvent to be in a paste state, and the paste is coated on the positive

electrode collector, and dried." Tanjo, paragraph [0035], emphasis added. Therefore, Applicant respectfully submits that combining Tanjo with Tajima would result in an electrode structure that utilizes a binder contrary to the limitations of claim 1.

The aforementioned arguments in view of the fact that the combination of Tajima and Tanjo do not teach, disclose, or suggest an electrode structure having an electrode active material with a density "less than or equal to 1.4 grams per cubic centimeter in an upper region" as claimed in Applicant's claim 8 overcomes the rejection thereto no *prima facie* case of obviousness has been presented with respect to said claim.

Therefore, and consistent with the foregoing, (i) all of the elements and limitations of claim 8 are not disclosed by combining Tanjo and Tajima, (ii) there is no inherent motivation or suggestion to combine Tanjo and Tajima within said art as required for a *prima facie* allegation of obviousness, and (iii) Tanjo and Tajima either teach away from one another, or their combination would result in an inoperable device as described in detail in Section IV. Accordingly, and at least for the reasons stated above, Applicant respectfully submits that the rejections of claim 8 under 35 U.S.C. § 103(a) over Tajima in view of Tanjo is overcome and should be withdrawn.

In addition, Applicant respectfully submits that the rejection of claim 10 in view of Tajima and Tanjo is also overcome and should be withdrawn because claim 10 depends from nonobvious claim 8. "If an independent claim is not obvious under 35 U.S.C. §103, then any claim depending therefrom is not obvious." MPEP § 2143.03 (citing *In re Fine*, 837 F.2d 1382,

1385 (C.C.P.A. 1970)). As claim 10 depends from nonobvious claim 8, the rejection of claim 10 is moot and should be withdrawn.

VI. The Rejection of Claim 5 Under 35 U.S.C. § 103(a) as Allegedly Being Obvious Over Tajima in View of Tanjo as Applied to Claims 1, 4, and 6 and Further in View of Nakai is Overcome and Should be Withdrawn.

Applicant respectfully submits that the rejection of claim 5 under 35 U.S.C. § 103(a) is overcome and should be withdrawn because Tajima and Tanjo, either alone or in view of one another, do not disclose all of the limitations of independent claim 1, for which rejected claim 5 is dependent therefrom. Applicant respectfully submits that the rejection of claim 5 in view of at least Tajima and Tanjo is now moot and should be withdrawn because claim 5 depends from nonobvious claim 1. "If an independent claim is not obvious under 35 U.S.C. §103, then any claim depending therefrom is not obvious." MPEP § 2143.03 (citing *In re Fine*, 837 F.2d 1382, 1385 (C.C.P.A. 1970)). As claim 5 depends from nonobvious claim 1, the rejection of claim 5 is moot and should be withdrawn.

VII. Petition for an Extension of Time to Submit the Present Response.

Applicant respectfully petitions for an extension of time of one (1) month, under 37 C.F.R. § 1.136(a), thereby extending the deadline for response, pursuant to 37 C.F.R. §§ 1.7(a) & 1.136(a), to Monday, February 28, 2011. Applicant shall authorize payment for this extension in the amount of \$65.00 (small entity) via credit card at the time of electronically filing the present Response.

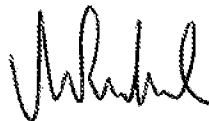
CONCLUSION

For all the foregoing reasons, it is respectfully submitted that Applicant has made a patentable contribution to the art and that this response places the Application in condition for allowance. Accordingly, favorable reconsideration and allowance of claims 1, 4-6, 8, and 10-21 of this Application is respectfully requested.

In the event Applicant has inadvertently overlooked the need for a payment of an additional fee or for an additional extension of time, Applicant conditionally petitions therefor, and authorizes any fee deficiency to be charged to deposit account 09-0007. When doing so, please reference the above-listed docket number.

Respectfully submitted,

ICE MILLER LLP



Mark C. Reichel

Registration No.: 53,509

ICE MILLER LLP

One American Square, Suite 2900
Indianapolis, Indiana 46282-0200
(317) 236-2100